REMARKS

This response is intended as a full and complete response to the Office Action mailed on June 19, 2007. In view of the following amendment and discussion, the Applicants believe that all claims are in allowable form.

CLAIM REJECTIONS

35 U.S.C. §103 Claims 1-4, 6, 8-12, 15 and 16

Claims 1-4, 6 and 8-12 stand rejected under 35 U.S.C. § 102(b) as being anticipated over *Xu* (EP 0758148) in view of *Sone* (US. Pat. 6,451,184). In response, the Applicants have amended claim 1 to more clearly recite certain aspects of the invention.

Independent claim 1 recites elements not taught or suggested *Xu* and *Sone*. *Xu* teaches supplying a gas mixture into a chamber to deposit a TiN layer without collimated seed layer. The gas mixture is maintained in a space between the target and the substrate and reacts with the material sputtered from a target disposed in the chamber. *Xu* does not teach or suggest applying power to a sputtering target and a coil disposed between a sputtering target and a substrate positioned on a substrate support member in the presence of only a first gas. Furthermore, *Xu* does not teach or suggest introducing a second gas into a chamber to deposit metal containing film layers, wherein the second gas is introduced through an second inlet port disposed proximate a surface of a substrate in presence of power applied to a sputter target and a coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 1.

Sone teaches partitioning a gas space to have reactive gas contained between a partition member and a substrate and sputter gas contained between the partition and a target. The sputter and reactive gases GA, GB are supplied through showerheads 3, 4 to a target 1 and a substrate 2, respectively. The showerheads 3, 4 may each have ports with different configurations to direct different amounts of gas to the target surface or the substrate surface as needed. *Sone* requires separate showerheads, individual, specifically designed, *e.g.* equally distanced, holes and apertures for supplying reactive

gases toward a targeted region on a substrate disposed in the chamber. Therefore, *Sone* does not teach or suggest applying power to a sputtering target and a coil disposed between a sputtering target and a substrate positioned on a substrate support member in the presence of only a first gas. Furthermore, *Sone* does not teach or suggest introducing a second gas into a chamber to deposit metal containing film layers, wherein the second gas is introduced through an second inlet port disposed proximate a surface of a substrate in presence of power applied to a sputter target and a coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 1.

Neither *Xu* nor *Sone*, alone or in combination, teaches or suggests applying power to a sputtering target and a coil disposed between a sputtering target and a substrate positioned on a substrate support member in the presence of only a first gas, and introducing a second gas into a chamber to deposit metal containing film layers, wherein the second gas is introduced through an second inlet port disposed proximate a surface of the substrate in the presence of the power applied to the sputter target and the coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 1. Furthermore, there is no teaching or suggestion from *Sone* that would suggest to one of ordinary skill in the art to modify *Xu* in a manner that would yield introducing a second gas into a chamber to deposit metal containing film layers, wherein the second gas is introduced through an second inlet port disposed proximate a surface of the substrate in the presence of the power applied to the sputter target and the coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 1.

Thus, the Applicants submit that independent claim 1 and all claims depending therefrom are patentable over the combination of *Xu* and *Sone*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims be allowed.

35 U.S.C. §103 Claim 7

Claim 7 stands rejected under 35 U.S.C. § 103 as being unpatentable over *Xu* in view of *Sone* and further in view of *Lantsman* (US. Pat. 5,830,330). In response, the Applicants have amended claim 1 to more clearly recite certain aspects of the invention.

Independent claim 1 recites elements not taught or suggested *Xu*, *Sone* and *Lantsman*. The patentability of claim 1 over *Xu* and *Sone* has been discussed above. *Lantsman* teaches ramping up a power to a target in a processing chamber. However, there is no teaching or suggestions from *Lantsman* that would suggest to one of ordinary skill in the art to *Xu* and *Sone* in a manner that would yield applying power to a sputtering target and a coil disposed between a sputtering target and a substrate positioned on a substrate support member in the presence of only a first gas, and introducing a second gas into a chamber to deposit metal containing film layers, wherein the second gas is introduced through an second inlet port disposed proximate a surface of the substrate in the presence of the power applied to the sputter target and the coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 1.

Thus, the Applicants submit that claim 7 that depends from claim 1 is patentable over *Xu* and *Lantsman*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and claim 7 allowed.

35 U.S.C. §103 Claim 14

Claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu* in view of *Sone* and further in view of *Ngan* (US. Pat. 6,203,674). In response, the Applicants have amended claim 1 to more clearly recite certain aspects of the invention.

Independent claim 1 recites elements not taught or suggested by the combination of *Xu, Sone* and *Ngan*. The patentability of claim 1 over *Xu* and *Sone* has been discussed above. *Ngan* teaches using a target made by titanium. However, there is no teaching or suggestions from *Ngan* that would suggest to one of ordinary skill in the art to *Xu* and *Sone* in a manner that would yield applying power to a sputtering target and a coil disposed between a sputtering target and a substrate positioned on a substrate support member in the presence of only a first gas, and introducing a second

gas into a chamber to deposit metal containing film layers, wherein the second gas is introduced through an second inlet port disposed proximate a surface of the substrate in the presence of the power applied to the sputter target and the coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 1.

Thus, the Applicants submit that submit that claim 14 that depends from claim 1 is patentable over *Xu, Sone* and *Ngan*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and claim 14 be allowed.

35 U.S.C. §103 Claim 17

Claim 17 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu* in view of *Sone* and further in view of *Gilboa* (US. Pat. 5,108,569). In response, the Applicants have amended claims 1 and 17 to more clearly recite certain aspects of the invention.

Independent claim 1 recites elements not taught or suggested *Xu, Sone* and *Gilboa*. The patentability of claim 1 over *Xu* and *Sone* has been discussed above. *Gilboa* teaches a clamp ring disposed in a processing chamber. A plurality of cylinder conduits is used to create a passage from a ceiling of a chamber to direct gas to the interior volume 100 of the chamber. However, *Gilboa* does not teach or suggest supplying different gases at different locations of a chamber. There is no teaching or suggestion from *Gilboa* that would suggest to one of ordinary skill in the art to *Xu* and *Sone* in a manner that would yield applying power to a sputtering target and a coil disposed between a sputtering target and a substrate positioned on a substrate support member in the presence of only a first gas, and introducing a second gas into a chamber to deposit metal containing film layers, wherein the second gas is introduced through an second inlet port disposed proximate a surface of the substrate in the presence of the power applied to the sputter target and the coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 1.

Furthermore, any attempt to modify *Sone* to change the gas flow through the ports formed in the showerhead would render *Sone* unsatisfactory for its intended purpose. The Federal Circuit has held that "if [a] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *see also, MPEP* §2143.01. Here, *Sone* requires a particular arrangement of showerheads and ports formed therein to direct different amounts of gas to a desired object located in the chamber. As such, per *In re Gordon* and *MPEP* §2143.01, a *prima facie* case of obviousness has not been established because there is no motivation to modify *Sone* with the teachings of *Gilboa* in the manner suggested by the Examiner since any such modification would render *Sone* unsatisfactory for its intended purpose. Accordingly, *Gilboa* fails to teach or suggests a modification to *Xu* and *Sone* in a manner that would yield applying power to a sputtering target and a coil disposed between a sputtering target and a substrate positioned on a substrate support member in the presence of only a first gas, and introducing a second gas into a chamber to deposit metal containing film layers, wherein the second gas is introduced through an second inlet port disposed proximate a surface of the substrate in the presence of the power applied to the sputter target and the coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 1.

Thus, the Applicants submit that claim 17 that depends from claim 1 is patentable over *Xu, Sone* and *Gilboa*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and claim 17 be allowed.

35 U.S.C. §103 Claim 18

Claim 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu, Sone* in view of *Chikako* (Japan 06-041733). In response, the Applicants have amended claims 1 to more clearly recite certain aspects of the invention.

Independent claim 1 recites elements not taught or suggested *Xu, Sone* and *Chikako*. The patentability of claim 1 over *Xu* and *Sone* has been discussed above. *Chikako* teaches introducing reactive gas through a central portion of a substrate holder disposed in a processing chamber. However, there is no teaching or suggestion from *Chikako* that would suggest to one of ordinary skill in the art to *Xu* and *Sone* in a manner that would yield applying power to a sputtering target and a coil disposed between a sputtering target and a substrate positioned on a substrate support member in the presence of only a first gas, and introducing a second gas into a chamber to deposit metal containing film layers, wherein the second gas is introduced through an second inlet port disposed proximate a surface of the substrate in the presence of the power applied to the sputter target and the coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 1.

Thus, the Applicants submit that claim 18 that depends from claim 1 is patentable over *Xu, Sone* and *Chikako*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and claim 18 be allowed.

35 U.S.C. §103 Claims 19-22 and 26

Claims 19-22 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu* in view of *Sone* and in view of *Yamaguchi* (U.S. Patent 6,203,674). In response, the Applicants have amended claim 19 to more clearly recite certain aspects of the invention.

Independent claim 19 recites elements not taught or suggested *Xu, Sone* and *Yamaguchi*. The teachings of *Xu* and *Sone* have been discussed above. *Yamaguchi* teaches depositiong a TiN film by sputtering a target containing Ti. However, there is no teaching from *Yamaguchi* that would suggest to one of ordinary skill in the art to modify *Xu* and *Sone* in a manner that would yield creating a higher partial pressure of an active gas introduced through a second inlet port disposed proximate an upper surface of a substrate than at a sputtering target to deposit metal containing film layers in the presence of the power applied to the sputter target and the coil, wherein the active gas from the second inlet port is supplied through a gap defined between a shield ring and

the substrate support member, as recited by claim 19. As such, a *prima facie* case of obviousness has not been established as the references fail to teach or suggest each claimed element.

Thus, the Applicants submit that independent claim 19 and claims 20-22 and 26 depending therefrom are patentable over *Xu, Sone* and *Yamaguchi*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims be allowed.

35 U.S.C. §103 Claim 23

Claim 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu* in view of *Sone* and in view of *Yamaguchi* and further in view of *Ngan*. In response, the Applicants have amended claim 19 to more clearly recite certain aspects of the invention.

Independent claim 19 recites elements not taught or suggested *Xu, Sone, Yamaguchi* and further in view of *Ngan*. The patentability of claim 19 over the combination of *Xu, Sone,* and *Yamaguchi* has been discussed above. *Ngan* teaches using a target made by titanium. However, there is no teaching from *Ngan* that would suggest to one of ordinary skill in the art to modify *Xu, Sone,* and *Yamaguchi* in a manner that would yield creating a higher partial pressure of an active gas introduced through a second inlet port disposed proximate an upper surface of a substrate than at a sputtering target to deposit metal containing film layers in the presence of the power applied to the sputter target and the coil, wherein the active gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 19. As such, a *prima facie* case of obviousness has not been established as the references fail to teach or suggest each claimed element.

Thus, the Applicants submit that claim 23 that depends from claim 19 is patentable over *Xu, Sone, Yamaguchi* and further in view of *Ngan*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and claim 23 be allowed.

35 U.S.C. §103 Claim 24

Claim 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu* in view of *Sone* and in view of *Yamaguchi* and further in view of *Gilboa*. In response, the Applicants have amended claims 19 and 24 to more clearly recite certain aspects of the invention.

Independent claim 19 recites elements not taught or suggested *Xu, Sone, Yamaguchi* and further in view of *Gilboa*. The patentability of claim 19 over the combination of *Xu*, *Sone,* and *Yamaguchi* has been discussed above. *Gilboa* teaches a clamp ring disposed in a processing chamber. A plurality of cylinder conduits is used to create a passage from a ceiling of a chamber to direct gas to the interior volume 100 of the chamber. However, *Gilboa* does not teach or suggest supplying different gases at different locations of a chamber. There is no teaching from *Gilboa* that would suggest to one of ordinary skill in the art to modify *Xu*, *Sone,* and *Yamaguchi* in a manner that would yield creating a higher partial pressure of an active gas introduced through a second inlet port disposed proximate an upper surface of a substrate than at a sputtering target to deposit metal containing film layers in the presence of the power applied to the sputter target and the coil, wherein the active gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 19. Additionally, as discussed above, modifying *Sone* by the teaching *Gilboa* would render *Sone* unsatisfactory for its intended purpose. As such, a *prima facie* case of obviousness has not been established as the references fail to teach or suggest each claimed element.

Thus, the Applicants submit that claim 24 that depends from claim 19 is patentable over *Xu, Sone, Yamaguchi* and further in view of *Gilboa*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and claim 24 be allowed.

35 U.S.C. §103 Claim 25

Claim 25 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu* in view of *Sone* and in view of *Yamaguchi* and further in view of *Chikako*. In response, the Applicants have amended claim 19 to more clearly recite certain aspects of the invention.

Independent claim 19 recites elements not taught or suggested *Xu, Sone, Yamaguchi* and further in view of *Chikako*. The patentability of claim 19 over the combination of *Xu*, *Sone,* and *Yamaguchi* has been discussed above. *Chikako* teaches introducing reactive gas through a central portion of a substrate holder disposed in a processing chamber. However, there is no teaching from *Chikako* that would suggest to one of ordinary skill in the art to modify *Xu*, *Sone,* and *Yamaguchi* in a manner that would yield creating a higher partial pressure of an active gas introduced through a second inlet port disposed proximate an upper surface of a substrate than at a sputtering target to deposit metal containing film layers in the presence of the power applied to the sputter target and the coil, wherein the active gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 19. As such, a *prima facie* case of obviousness has not been established as the references fail to teach or suggest each claimed element.

Thus, the Applicants submit that claim 25 that depends from claim 19 is patentable over *Xu, Sone, Yamaguchi* and further in view of *Chikako*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and claim 25 be allowed.

35 U.S.C. §103 Claim 27

Claim 27 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu* in view of *Sone* and in view of *Ngan* and further in view of *Yamaguchi*. In response, the Applicants have amended claim 27 to more clearly recite certain aspects of the invention.

Independent claim 27 recites elements not taught or suggested *Xu, Sone, Ngan,* and *Yamaguchi*. The teachings of *Xu* and *Sone* have been discussed above. *Yamaguchi* teaches depositing a TiN film by sputtering a target containing Ti. *Ngan* teaches using a target made by titanium. However, there is no teaching from *Ngan* and

Yamaguchi that would suggest to one of ordinary skill in the art to *Xu* and *Sone* in a manner that would yield creating a higher partial pressure of nitrogen through a second inlet port disposed proximate an upper surface of a substrate than at a sputtering target to deposit metal containing film layers in presence of power applied to the sputter target and the coil, wherein the nitrogen from the second inlet port is supplied through a gap defined between a shield ring and a substrate support member, as recited by claim 27. As such, a *prima facie* case of obviousness has not been established as the references fail to teach or suggest each claimed element.

Thus, the Applicants submit that independent claim 27 is patentable over *Xu, Sone, Ngan* and further in view of *Yamaguchi*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and claim 27 be allowed.

35 U.S.C. §103 Claims 28-31

Claims 28-31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu* in view of *Sone* and in view of *Takehara* (U.S. Patent 5,340,459) and further in view of *Yamaguchi*. In response, the Applicants have amended claim 28 to more clearly recite certain aspects of the invention.

Independent claim 28 recites elements not taught or suggested *Xu, Sone, Takehara,* and *Yamaguchi*. The teachings of *Xu* and *Sone* have been discussed above. *Takehara* teaches a pipe adapted to introduce gas into a processing chamber near a substrate. *Yamaguchi* teaches depositiong a TiN film by sputtering a target containing Ti. However, there is no teaching from *Takehara* and *Yamaguchi* that would suggest to one of the ordinary skill in the art to *Xu* and *Sone* in a manner that would yield introducing a second gas into the chamber through a second inlet port disposed proximate the upper surface of the substrate to deposit the metal containing film layers in the presence of the power applied to the sputter target and the coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 28. As such, a *prima facie* case of obviousness has not been established as the references fail to teach or suggest each claimed element.

Thus, the Applicants submit that independent claim 28 and claims 29-31 depending therefrom are patentable over *Xu, Sone, Takehara* and further in view of *Yamaguchi*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims be allowed.

35 U.S.C. §103 Claim 32

Claim 32 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu* in view of *Sone* and in view of *Takehara* and in view of *Yamaguchi* and further in view of *Ngan*. In response, the Applicants have amended claim 28 to more clearly recite certain aspects of the invention.

Independent claim 28 recites elements not taught or suggested *Xu, Sone, Takehara, Yamaguchi* and *Ngan*. The teachings of *Xu, Sone, Takehara* and *Yamaguchi* have been discussed above. *Ngan* teaches using a target made by titanium. However, *Ngan* fail to teach or suggest a modification to *Xu, Sone, Takehara* and *Yamaguchi* that would yield introducing a second gas into the chamber through a second inlet port disposed proximate the upper surface of the substrate to deposit the metal containing film layers in the presence of the power applied to the sputter target and the coil, wherein the second gas from the second inlet port is supplied through a gap defined between a shield ring and the substrate support member, as recited by claim 28. As such, a *prima facie* case of obviousness has not been established as the references fail to teach or suggest each claimed element.

Thus, the Applicants submit that claim 32 that depends from is patentable over *Xu, Sone, Takehara* and *Yamaguchi* and further in view of *Ngan*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and claim 32 be allowed.

CONCLUSION

Thus, for at least the reasons discussed above, the Applicants submit that all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and swift passage to issue are earnestly solicited.

If the Examiner believes that any unresolved issues still exist, it is requested that the Examiner telephone Keith Taboada at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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Date

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